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Indian Standard

**METHOD FOR
DETERMINATION OF COLOUR FASTNESS OF
TEXTILE FLOOR COVERINGS TO SHAMPOOING**

UDC 677.643 : 677.016.474 : 535.685.2

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG,
NEW DELHI 110002

Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE FLOOR COVERINGS TO SHAMPOOING

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Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE FLOOR COVERINGS TO SHAMPOOING

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 15 November 1986, after the draft finalized by the Chemical Methods of Test Sectional Committee had been approved by the Textile Division Council.

0.2 Textile floor coverings form a large part of export of textiles. Colour fastness to shampooing is an important parameter to check the quality of the product for everyday use. Hence formulation of a standard method of test for determining colour fastness of textile floor coverings to shampooing needs no emphasis.

1. SCOPE

1.1 This standard prescribes a method for determination of colour fastness of textile floor coverings, yarns and loose fibres intended for manufacture of textile floor coverings; and the tufts extracted from textile floor coverings to the action of a standard shampoo solution.

2. PRINCIPLE

2.1 A specimen of the textile floor covering, yarn, loose fibre, or tufts; in contact with specified adjacent fabrics, is immersed under pressure in a solution of shampoo buffered to pH 7.5 ± 0.2 . The specimen and adjacent fabrics are dried separately. The change in colour of the specimen and the staining of the adjacent fabrics are assessed with standard grey scales.

3. SAMPLING

3.1 The sample of textile floor covering, yarn, fibre or tufts shall be so drawn as to be representative of the lot. Sample drawn in accordance with the procedure laid down in the material specification or as agreed to between the buyer and the seller shall be held to be representative of the lot.

4. APPARATUS AND REAGENTS

4.1 AATCC Perspirometer — This instrument has been developed by the American Association of Textile Chemists and Colourists. Any other equivalent apparatus giving identical results may also be used.

4.2 Flat-bottomed Dish — about 100 mm × 150 mm and 50 mm deep.

4.3 Smooth Glass Plate or Clear Acrylic Resin Plate — about 113 mm × 60 mm and 3 mm thick.

4.4 Weight-piece — of Mass About 5 kg.

4.5 pH meter — equipped with Glass Calomel Electrodes.

4.6 Shampoo Solution — prepared by dissolving 1 g sodium lauryl sulphate (active ingredient) and 0.2 g lauric mono-isopropanolamide in about 500 ml of deionized or distilled water. Heat, if necessary to ensure the dissolution of the surfactant. Cool to about 30°C. Prepare buffer solution by adding 14 ml of 0.5 M citric acid to 372 ml of 0.5 M disodium hydrogen phosphate (*see also* IS : 3225-1965*). Add the buffer solution to the surfactant solution. Check the pH to 7.5 ± 0.2 . Finally make the total volume of shampoo solution up to one litre.

4.7 Adjacent Fabrics

4.7.1 When the specimen is in the form of a textile floor covering, two adjacent fabrics 50 mm × 40 mm are required, one piece made of the same fibre as that in the specimen or that predominating in the case of blends, the second piece made of any other fibre (*see* Table 1). If the staining of additional fibres is of interest, two or more specimens shall be tested separately.

4.7.2 When the specimen is in the form of yarn or loose fibre, two adjacent fabrics 100 mm × 40 mm are required, one piece made of the same fibre as that in the specimen or that predominating in the case of blends, the second piece made of any other fibre (*see* Table 1). If the staining of additional fibres is of interest, two or more specimens shall be tested separately.

4.7.3 When the specimen is in the form of tufts extracted from a textile floor covering, two adjacent fabrics 50 mm × 40 mm are required, one piece made of cotton, to act solely as a support for the tufts, the second piece made of the same fibre as that in the specimen

*Method for preparation of buffer solutions.

or that predominating in the case of blends, or any other fibre (see Table 1). If the staining of two or more fibres is of interest, two or more specimens shall be tested separately.

TABLE 1 CONSTRUCTIONAL DETAILS OF ADJACENT FABRICS

(Clauses 4.7.1, 4.7.2 and 4.7.3)

| SL No. | ADJACENT FABRIC | MASS IN g/m ² | TYPE OF WEAVE | ENDS/cm | PICKS/cm | TEX OF YARN | |
|--------|-----------------|--------------------------|---------------|----------|----------|---------------------|---------------------|
| | | | | | | Warp | Weft |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| i) | Cotton | 115 ± 5 | 1/1 Plain | 35 | 31 | 16·5 | 14·0 |
| ii) | Viscose | 140 ± 5 | 1/1 Plain | 28 | 22 | 20·0 | 33·0 |
| iii) | Wool | 125 ± 5 - 0 | 1/1 Plain | 21 ± 0·5 | 18 ± 0·5 | 15·6 × 2 Worsted | 15·6 × 2 Worsted |
| iv) | Polyamide | 130 ± 5 | 1/1 Plain | 17·5 | 20 | 10 × 2 | 20 |
| v) | Polyester | 130 ± 5 | 1/1 Plain | 23·5 | 20·5 | 7·5 × 2 | 20 |
| vi) | Acrylic | 135 ± 5 | 1/1 Plain | 17·5 | 16 | 10 × 2 | 10 × 2 |

NOTE 1 — For wool adjacent fabric additional requirements are:

- a) pH value of aqueous extract = 6·5 to 7·5,
- b) Residual fat content = 0·4 ± 0·1 percent, and
- c) Alkali solubility — less than 18 percent.

NOTE 2 — For polyamide and acrylic adjacent fabrics, additional requirements are:

- a) pH value of aqueous extract = 7 ± 0·5, and
- b) Residual oil content less than 1·0 percent.

NOTE 3 — For polyester adjacent fabric, additional requirement is residual oil content less than 0·5 percent.

NOTE 4 — The adjacent fabrics shall be bleached and free from any sizing or finishing material and optical brightening agents.

4.8 Grey Scales — for evaluating change in colour and staining of adjacent fabrics (see IS : 768-1982* and IS : 769-1982†).

5. PREPARATION OF COMPOSITE TEST SPECIMENS

5.1 If a textile floor covering is to be tested, cut a specimen 100 mm × 40 mm, from which any integral foam underlay has been removed, and cover the use surface with the two pieces of adjacent fabrics 50 mm × 40 mm (see 4.7.1).

*Method for evaluating change in colour (first revision).

†Method for evaluating staining (first revision).

5.2 If yarn is to be tested, sew a uniform layer of parallel 100 mm lengths, weighing 0.4 g, to one edge of one of the piece of adjacent fabrics 100 mm × 40 mm (*see 4.7.2*) Cover with the other piece 100 mm × 40 mm and sew along the same edge to form a composite specimen.

5.3 If loose fibre is to be tested, comb and compress 0.4 g of the fibre into a uniform layer 100 mm × 40 mm. Place this between the two pieces of adjacent fabrics 100 mm × 40 mm (*see 4.7.2*) and sew along two opposite sides to form a composite specimen.

5.4 If tufts extracted from textile floor coverings are to be tested, sew a number of identical tufts weighing approximately 0.2 g on to a piece of cotton adjacent fabric 50 mm × 40 mm. Cover with a piece of adjacent fabric 50 mm × 40 mm (*see 4.7.3*) and sew along one side to form a composite specimen.

6. PROCEDURE

6.1 Place the composite specimen in the flat-bottomed dish (*see 4.2*) and pour over the specimen a quantity of the shampoo solution (*see 4.6*) at $27 \pm 2^\circ\text{C}$ sufficient to give a liquor ratio of 50 : 1. Ensure that the specimen is thoroughly wetted by the solution and lies flat. Cover with the glass plate (*see 4.3*), press with the fingers to remove air bubbles, and place the weight-piece (*see 4.4*) on top of the glass plate. A composite specimen of tufts should be placed in the dish with the cotton on the underside.

NOTE — Care should be taken so that the material of the weight does not react with the solution during testing.

6.2 Allow it to stand at $27 \pm 2^\circ\text{C}$ for 15 minutes in the perspirometer. Remove the weight-piece and pour off the shampoo solution without removing the glass plate, replace the weight-piece and allow it to stand for a further period of three hours at $27 \pm 2^\circ\text{C}$.

6.3 Remove the weight-piece and glass plate. Separate the specimen from the adjacent fabrics and allow the specimen and the adjacent fabrics to dry apart in air at a temperature not exceeding 60°C .

6.4 Assess the change in colour of the specimen and the staining of the adjacent fabrics with the grey scales (*see IS : 768-1982** and *IS : 769-1982†*). When tufts are being tested, the staining of the cotton support need not be assessed.

*Method for evaluating change in colour (*first revision*).

†Method for evaluating staining (*first revision*).

NOTE — In case of doubt in the colour fastness rating as assessed by an observer, the assessment may be made by three observers and the overall average rating may be reported accordingly.

7. REPORT

7.1 Report shall include the following information:

- a) Type of material;
- b) Numerical rating for change in colour of each test specimen;
and
- c) Numerical rating for staining of each kind of adjacent fabric used.

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